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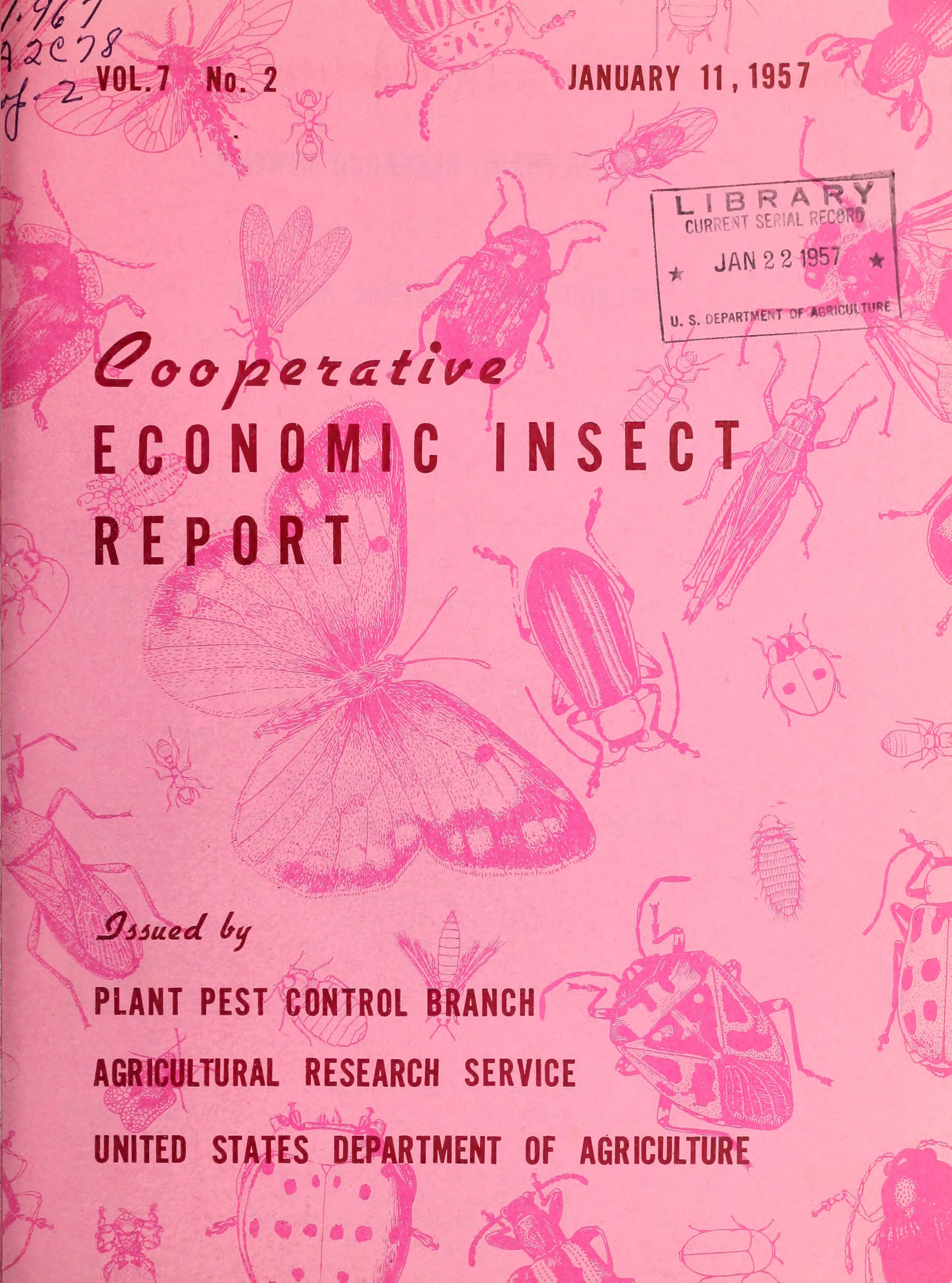

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL BRANCH
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL BRANCH

PLANT PEST SURVEY SECTION

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Branch serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Plant Pest Survey Section
Plant Pest Control Branch
Agricultural Research Service
United States Department of Agriculture
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Volume 7 January 11, 1957 Number 2

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

GRASSHOPPER outlook for 1957. (see end of book).

WINTER GRAIN MITE light to heavy on small grains in north central Texas. (p. 15).

GREENBUG heavy on oats in Jackson County, Georgia. (p. 15).

SPOTTED ALFALFA APHID building up rapidly in Yuma, Arizona area, active in some sections of Oklahoma and Texas and occurring in southern Illinois. (p. 15).

SOUTHERN PINE BEETLE continues serious in some western North Carolina areas. (p. 16).

SUMMARY OF INSECT CONDITIONS - 1956 - Minnesota (p. 19), Nevada (p. 23).

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INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

In compliance with an expression by the Entomological Society of America Committee on Insect Surveys and due to the growing demand from State, Federal and other agencies for information on insects not known to occur in the United States, short general statements on important foreign species will be released periodically in the Cooperative Economic Insect Report. Brief notes on economic importance, host, distribution, description and life history will be included along with illustrations when obtainable. The data will be assembled from ARS files and the literature. Plant Quarantine Branch and Entomology Research Branch are kindly assisting in the preparation of these reports. Separates may be obtained from Plant Pest Survey Section. The first release is on page 27.

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Reports in this issue are for the week ending January 4 unless otherwise designated.

WEATHER BUREAU'S 30-DAY OUTLOOK

January 1957

The Weather Bureau's 30-day outlook for January calls for temperatures to average below seasonal normals over most of the eastern half of the nation with greatest departures over the Northeast. Temperatures not far from normal are anticipated in the West and along the Gulf Coast.

Precipitation is expected to exceed normal east of the Appalachians, with considerable snow from Virginia northward. Central and southern portions of the West Coast are also expected to have above normal precipitation. Below normal amounts are predicted for the Northern Plains, Great Lakes Region, and the far Southwest. In unspecified areas near normal amounts are in prospect.

Weather forecast given here is based on the official 30-day "Resume and Outlook," published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

WEATHER OF THE WEEK ENDING JANUARY 7, 1957

Again the week's weather was marked by heavy snows in the Northeast. Beginning late Sunday and continuing through Monday, the counter-clockwise winds around a low pressure center moving northeastward along the Atlantic coast brought warm, moist air into conjunction with cold air over the land. From northern Virginia into parts of New England snowfall accumulations of more than 2 inches up to a foot and a half, respectively, were reported. Snow flurries of lighter intensity also prevailed from Michigan and Ohio to the Appalachians during the same period. Precipitation through Sunday was primarily light, but extended over most of the country. Only a few isolated areas in the West, southeastern Georgia, and the major portion of Florida reported none. Heavy to moderate totals were observed along the extreme Northwest Coast, in extreme southeastern Arizona and southwestern New Mexico and over a band, 100 to 200 miles wide, extending from northern Texas through Tennessee. Additional rains and snows were being received in the extreme West at the end of the period, and although they were mostly light, close to an inch of rain had fallen near San Diego, California by Tuesday morning. Mild to near seasonal weather prevailed throughout the Plain States and also in the extreme North and Southwest, with temperatures for the week averaging above normal by more than 6° in northeastern Montana, and by as much as 9° along the Gulf coast in Texas. Colder conditions prevailed in central portions of the extreme West as they did over most of the country from the Mississippi eastward. Average departures for the week were more than 18° below normal in northern Maine, and this State as well as others in the East reported the coldest week of the season, or in some cases the coldest weather in over 13 months. On January 3, the coldest day in the area, minimum temperatures reached zero levels as far south as northern Maryland and freezing levels as far

(Weather continued on p. 18).

CEREAL AND FORAGE INSECTS

BROWN WHEAT MITE (Petrobia latens) - OKLAHOMA - In oats in Johnston and Pontotoc Counties. (Flora).

WINTER GRAIN MITE (Penthaleus major) - TEXAS - Infestations from light to heavy on small grains in north central area. (Garner).

CUTWORMS - OKLAHOMA - Early-instar larvae found in two wheat fields in Custer County. (Hudson).

GREENBUG (Toxoptera graminum) - GEORGIA - Heavy infestation on oats in Spalding and Butts Counties. All stages present, Dec. 12. (Tippins). Heavy infestations on oats in Jackson County. (Johnson, Jan. 3).

APHIDS - NORTH CAROLINA - An infestation, probably Toxoptera graminum, in 20 acres of small grain in Edgecombe County, Dec. 14. (Scott).

SPOTTED ALFALFA APHID - ARIZONA - Building up rapidly in Yuma area during past two weeks, to highest populations since last spring. Winged forms reached peak Dec. 7. Entomophagous fungi have been almost non-existent this fall and winter in Yuma area. (Ariz. Coop. Rept.). TEXAS - Medium infestation on seedling alfalfa in Brazos and Burleson Counties. (Randolph). OKLAHOMA - Heavy in isolated fields in Logan County. (Flora). ILLINOIS - Occurring south of highway 40 from St. Louis to Effingham. (Petty).

A ROOT APHID (Forda olivacea) - CALIFORNIA - Collected from grass roots at Guadalupe, Santa Barbara County. Has been collected from numerous locations previously. (Cal. Coop. Rept., Dec. 28).

A CHINCH BUG (Blissus leucopterus insularis) - FLORIDA - Adults averaged five per square foot of St. Augustine grass at Miami, Dade County, Oct. 17 (Dowling) and five per square foot of Bermuda grass at Deerfield, Broward County, Dec. 17 (Preston).

CLOVER SEED CHALCID (Bruchophagus gibbus) - UTAH - In 1956, infestation averaged 9.2 percent in first-crop alfalfa seed and 22.2 percent in second crop alfalfa seed in western Millard County area. One field of second-crop at Newton averaged 12.5 percent seed infested and one field of 22 varieties sampled near Logan averaged 22.2 percent infested seed. (Davis).

FRUIT INSECTS

MEXICAN FRUIT FLY (Anastrepha ludens) - CALIFORNIA - Bait spray application begun for 54th time in San Diego County barrier strip. On 409 properties, 3861 host trees and 355 shade trees were sprayed by State crews. In the San Ysidro area in San Diego County, 1045 traps were in operation. In other areas of this county 1657 traps are in operation. No specimens taken in in any stage. (Cal. Coop. Rept., Dec. 28).

TRUCK CROP INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) --GEORGIA - Heavy infestations of larvae defoliating turnips and mustard in Spalding County, Dec. 27. (Dupree).

BEET LEAFHOPPER (Circulifer tenellus) - CALIFORNIA - Surveys showed no concentrations in Coalinga area although well scattered over perennials. In Los Banos hills of Merced County, concentrations occurred in swales where Hemizonia was green. Survey in Rio Vista, Fairfield and Vacaville areas showed few places favorable for reproduction. (Cal. Coop. Rept., Dec. 28).

MELON FLY (Dacus cucurbitae) - CALIFORNIA - No captures made during the period. (Cal. Coop. Rept., Dec. 28).

COTTON INSECTS

PINK BOLLWORM (Pectinophora gossypiella) - OKLAHOMA - Inspections of 175 open bolls in Jackson and Caddo Counties showed 19 live and 27 dead larvae; 60 bolls in surface debris showed negative. Two lint cleaners inspected in Harmon and Jackson Counties showed no live and 55 dead larvae. (State-Fed. PBW Cont. Prog.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - NORTH CAROLINA Infestation in pitch, short-leaf and Virginia pines still serious in Buncombe and Cherokee Counties and scattered in most far western counties. (Green).

AN APHID (Cinara sp.) - NORTH CAROLINA - Heavy infestation locally on white pine in Wake County. (Scott, Smith).

JUNIPER SCALE (Diaspis carueli) - WEST VIRGINIA - Moderate infestation in red cedar in Marion County. (Dorsey, Hansen, Gillespie, Dec. 28).

DICTYOPSERMUM SCALE (Chrysomphalus dictyospermum) - VIRGINIA - Heavy on holly trees in Warwick City. (Amos, Sedivy).

SCALE INSECTS - CALIFORNIA - Asterolecanium arabidis submitted from infested pittosporum at Marysville, Yuba County. First record for county. (Cal. Coop. Rept., Dec. 28). FLORIDA - Asterolecanium puteanum average 100 per stem of Chinese holly at Tampa, Hillsborough County, Dec. 17. (Hale). VIRGINIA - Ceroplastes sp. average about 50 per kneehigh boxwood in Holland. (Miller). GEORGIA - A wax scale (prob. *Ceroplastes ceriferus*) was generally heavy on flowering quince and other shrubs in Griffin area, Dec. 17. (Tippins).

INSECTS AFFECTING MAN AND ANIMALS

HEAD LOUSE (*Pediculus humanus capitis*) - VIRGINIA - Infestation reported by a Lynchburg doctor about Dec. 11. (Rowell, Amos).

CATTLE GRUBS - OKLAHOMA - Counts on mature cows at Stillwater averaged four grubs per animal and 1.8 at El Reno. Counts on yearlings at Coalgate averaged 13.9 grubs per animal. (Schomberg). VIRGINIA - Beginning to show up in backs of cattle in Montgomery County herds. (Turner).

CATTLE LICE - UTAH - Continue to be reported as abundant from additional areas. (Knowlton). OKLAHOMA - Increasing in Washita County with one herd of 125 cows and calves heavily infested. (Bower).

BROWN DOG TICK (*Rhipicephalus sanguineus*) - OKLAHOMA - Heavy at home site in Oklahoma City. (Bower).

STORED PRODUCTS INSECTS

KHAPRA BEETLE (*Trogoderma granarium*) - CALIFORNIA - A new property found infested in Riverside County making a total of 17 for that county and a new infestation in Holtville is the 21st for that city and the 156th for Imperial County. A total of 280 infestations in 18 counties have been found with a volume of 71,388,331 cubic feet of storage. Of this number 262 involving 67,021,964 cubic feet, have been treated. sites are under contract and have 2,421,838 cubic feet of storage. (Cal. Coop. Rept., Dec. 28).

CADELLE (*Tenebroides mauritanicus*) - TEXAS - Infesting wooden bin of wheat in Clay County. (Collier).

AN OTITID (*Chrysomyza demandata*) - OKLAHOMA - Heavy larval populations in some corn, sorghum and alfalfa silage in western counties. (Flora).

MISCELLANEOUS INSECTS

CLUSTER FLY (*Pollenia rudis*) - VIRGINIA - Large numbers in some Blacksburg and Craig County homes. (Amos).

BROWN-BANDED ROACH (*Supella supellectilium*) - ARIZONA - Widely distributed in Yuma County. (Ariz. Coop. Rept.). Add this county to distribution map shown in CEIR 6(52):1140.

OLD HOUSE BORER (Hylotrupes bajulus) - NORTH CAROLINA - Infesting timbers in a home in Lee County. (Jones, Wright).

LIGHT TRAP COLLECTIONS

SOUTH CAROLINA (Charleston County, Dec. 24-30): Pseudaletia unipuncta, 1; Feltia subterranea, 1.

GEORGIA (Spalding County, Dec. 21-27): F. subterranea, 2.

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Weather continued from p. 18.

south as Florida. A hard freeze southward to the upper coastal regions of Georgia was also reported on this date. As an Arctic air mass moves into the northern Plain States at this time the unseasonably warm conditions which have prevailed in this area for the past two weeks are being reversed. Additional snowfalls during the week have slightly extended the snow cover at lower elevations, but they mainly have increased depths in northeastern areas. The one-inch snow cover on Monday morning included that area north of a line extending from north-central Montana to southwestern West Virginia, thence northeastward to Baltimore, Maryland. Some current snow depths in the New England area are 19 inches at Rumford, and 15 inches at Portland in Maine, and 11 inches at Boston, Massachusetts. At higher elevations in the West, reports include measurements of 105 inches at Mount Baker Lodge, Washington; 85 at Paradise Ranger Station, Washington; 7 inches at Twin Lakes, California; and 24 inches at West Yellowstone, Montana. The Mississippi is now frozen to a depth of 6 inches at Dubuque, Iowa and 9 inches at La Crosse, Wisconsin and the Missouri River to 14 inches at Williston, North Dakota. In Maine, ice reports include 15 inches at Greenville and 12 inches at Millinocket. (Summary Supplied U.S. Weather Bureau).

SUMMARY OF INSECT CONDITIONS - 1956

MINNESOTA

Reported by R. Flaskerd, H. Graeber, E. McConnell, T. Aamodt, W. P. Trampe, J. R. Sandve and J. W. Butcher.

Cereal and Forage Crop Insects : GRASSHOPPERS were Minnesota's number one agricultural problem in 1956 with infestations centering almost entirely about legume fields. Egg-laying conditions were excellent during the long, dry fall of 1955. In some areas, egg hatch and nymphal development were suppressed because of cool weather conditions and heavy vegetation growth during the spring. In the southeast, southwest and parts of the central districts, extremely heavy hatches occurred, as a rule taking place later than 1955 with no hatch found anywhere until after the first cutting of alfalfa. Melanoplus femur-rubrum was the most abundant and important species of grasshoppers in the State; however, M. bivittatus and M. differentialis were present and important in localized areas. County agents reported that 218, 194 acres were sprayed in 1956, and it was their opinion that several times this acreage should have been sprayed. Since infestations centered about legumes, with grasshopper movement to other crops after hay harvest, the acreage sprayed represented a greater dollar saving than damaged legumes alone would indicate. The State was estimated by county agents to have saved some $820, 472. 00 by spraying. It was further estimated that farmers sustained a loss of $1, 851, 200. 00 where spraying was not done. Fall surveys indicated that considerable infestations might occur throughout large areas in 1957, particularly in the southeast, southwest and central districts. Surveys conducted in the spring of 1956 showed that EUROPEAN CORN BORER (Pyrausta nubilalis) mortality averaged 23 percent. Pupation was delayed by a cool, late spring so that peak moth flight and egg deposition was not reached until June 29. First-generation larval development was retarded due to cool weather and first instars of second generation were not reported until August 24. At that time 60 percent of the borers were in the 5th instar and 25 percent had emerged. Cool, rainy weather reduced second generation hatch and development. Fall abundance surveys revealed populations lower than last year, with many 3rd instar larvae present. Damage by corn borer was less than in 1955 due to well advanced corn development at time of borer pupation and the lateness of the second generation. The number of overwintering larvae, although less than in 1955, has the potential for high populations in 1957. SPOTTED ALFALFA APHID was found in southwestern area for the first time during the week of September 17. Surveys during the fall showed twelve counties infested (Brown, Cottonwood, Jackson, Lincoln, Lyon, Martin, Murray, Nobles, Pipestone, Redwood, Rock and Watonwan). Populations were too low to cause damage. ARMYWORM (Pseudaletia unipuncta) was quite general. Populations were low except in the west central district where infestations were reported (July 20) in barley and oats. Armyworm was not a problem in thin stands where moisture was lacking after planting. In lush grain fields, especially in wet portions, counts reached 6 per square foot of soil surface. Some chemical control was used in high count fields. Losses were probably low, at the time; populations were moderate, and the majority of the larvae were in the second instar as the grain was being swathed. WHEAT MIDGE (Sitodiplosis mosellana) was found (July 3) in damaging numbers in northwestern area. Marshall County was heaviest hit, with some fields having most of the heads infested. The wheat midge has not been considered a major pest of wheat in this State, although it has been reported intermittently over the past decade. ENGLISH GRAIN APHID (Macrosiphum granarium) was quite general on small grains. Populations remained low and no damage was noted. CRICKETS were reported quite heavy in the west central and Red River Valley areas. Damage to swathed grain caused by crickets clipping heads was noted in these areas. Prompt harvest of swathed grain prevented losses. BLACK BLISTER BEETLE (Epicauta pennsylvanica) populations have increased along with grasshoppers. Sweep counts continued to increase as the season progressed. Some fields of alfalfa reached 6 per sweep in late August. Reports made throughout the summer months noted damage to alfalfa, clover, soybeans and truck crops. Some chemical control was used on truck crops. The outlook for next year will probably be an increase in number of blister beetles. BILLBUGS (several species of Calendra) caused injury to corn on lowlands along the Minnesota River. In many fields examined, 10-20 percent of the corn plants showed damage. SEED CORN MAGGOT (Hylemya cilicrura) damage was reported (June 8) serious in sweet corn plantings in the south central district. Replanting was necessary in this area. WIREWORMS were a problem in sugar beet and potato fields in the Red River Valley. State-wide, infestations were spotty with some severe damage to corn. Control measures were used in corn fields in southern area. CORN ROOT WEBWORM (Crambus caliginosellus) completely destroyed a corn field in southern Minnesota. Reported also in central Minnesota. Replanting was necessary in this area. CUTWORMS were not too serious, but some damage was reported on soybeans and sugar beets in the south central area. SWEETCLOVER WEEVIL (Sitona cylindricollis) injury was the greatest in four years around the Grand Forks - Crookston area. High populations occurred in the northwest area for the remainder of the summer. In other areas, it was not a problem. A CURCULIONID (Sitona scissifrons) was a problem only on alfalfa in the northwest district. This was the first year this insect has been a problem in Minnesota. PEA APHID (Macrosiphum pisi) populations were lower this year than in the past. Populations failed to increase, except in certain fields, until mid-October when counts ranged as high as 40-50 per sweep. On field peas the early plantings, for the most part, did not need chemical control. LYGUS BUGS (Lygus sp.) and ALFALFA PLANT BUG (Adelphocoris sp.) numbers were low the entire summer. The highest counts were four per sweep in the southeast and south central districts. ALFALFA CATERPILLAR (Colias philodice eurytheme) was present over the southern half of Minnesota. No damage was noted.

Fruit Insects: MITES (Metatetranychus ulmi and Tetranychus telarius) caused less damage than in 1955. Miticides were used quite generally in commercial orchards. APPLE MAGGOT (Rhagoletis pomonella) emergence reached an early peak during the middle of July. APPLE CURCULIO (Tachypterellus quadrigibbus) and PLUM CURCULIO (Conotrachelus nenuphar) emerged during the week of May 20. Damage was light in commercial orchards where chemical control was used. Severe damage on apples and plums occurred on unsprayed backyard trees. RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) is becoming increasingly important in the apple orchards of southern area.

Truck Crops: ONION MAGGOT (Hylemya antiqua) continued to cause severe damage to untreated fields. Losses of up to 100 percent of the crop were reported from the Anoka area, including severe damage to some fields which were replanted without being properly treated with insecticides. CABBAGE MAGGOT (Hylemya brassicae) was an important pest of rutabagas in the east central counties. COLORADO POTATO BEETLE (Leptinotarsa decemlineata) continued to show a high level of resistance to DDT. Growers were forced to switch from DDT to some other insecticide. POTATO LEAFHOPPER (Empoasca fabae) was first found at Canton (Houston County) on May 22, and at St. Paul on May 26 according to A. G. Peterson. In spite of a late spring in 1956, E. fabae occurred only one day later than in 1955 when there was an unusually early spring. The population at St. Paul increased until a peak was reached in early August. Populations were higher at St. Paul than in 1955, and extensive injury occurred on alfalfa and potatoes. In the Crookston area the leafhoppers were less numerous than in 1955. WHITE GRUBS (Phyllophaga sp.) were troublesome throughout the growing season. They were mainly a problem in fields newly out of grass sod. SPIDER MITES (mainly Tetranychus telarius) were severe in the northern areas on strawberries. Chemical treatment was very effective. RASPBERRY SAWFLY (Monophadnoides geniculatus) was severe in unsprayed fields throughout the State. RASPBERRY CANE BORER (Oberea bimaculata) caused severe damage in old fields of raspberries.

Forest, Ornamental and Shade Tree Insects: JACK-PINE BUDWORM (Choristoneura pinus) infestation has increased in total acreage in Minnesota. Defoliation surveys conducted in July show that approximately 100,000 acres of jack-pine were moderately to heavily defoliated. An additional 240,000 acres were lightly defoliated. If the present budworm population maintains itself at present levels, or increases, chemical control work will be economically sound on many jack-pine stands. SPRUCE BUDWORM (Choristoneura fumiferana) generally increased in distribution and abundance throughout the spruce-fir stands in north eastern area. Defoliation ranged from light to heavy. In general, there was a marked increase in the number of stands that were heavily defoliated in 1956. An aerial survey conducted by the Lake States Forest Experiment Station assisted by the State Entomologist's Office showed heavy defoliation along the Canadian border extending from International Falls east to Gunflint Lake, extending south in St. Louis County to Lake Vermilion, and over an area west of Pelican Lake to state highway No. 6 in Koochiching County. Light to moderate defoliation occurred in much of the remaining spruce-fir stands in the northeast and north central districts. FOREST TENT CATERPILLAR (Malacosoma disstria) infestation in 1956 changed very little from last year. Heavy defoliation in 1956 was confined to small scattered areas, largely in the southern end of St. Louis County. The current outbreak, even though it has not completely disappeared, appears to have diminished to a subeconomic level. Very little, if any, of the area is important as resort or residential country. LARCH SAWFLY (*Pristiphora erichsonii*) defoliated tamarack in the State for the eighth consecutive year. Relatively heavy mortality has occurred on the rocky outcrop areas east of Florenton in the north east district. Mortality ranging from 0-14 percent is beginning to appear in the north central bogs. A PINE MOTH (*Eucosma sonomana*) caused heavy terminal and lateral breakage in some stands in central and north central Minnesota. Spotted locations of JACK-PINE SAWFLY (*Neodiprion pratti banksianae*) throughout the jack pine areas caused light defoliation. PINE TORTOISE SCALE (*Toumeyella numismaticum*) infestations were reported severe in jack pine plantations near Bemidji and Brainerd. Heavy feeding was noted in central and east central area by the RED-HEAD PINE SAWFLY (*Neodiprion lecontei*). Some control work was done in plantations in Sherburne County. The first known report of SWAINE JACK-PINE SAWFLY (*Neodiprion swainei*) in Minnesota was made near Littlefork. ZIMMERMAN PINE MOTH (*Dioryctria zimmermani*) infestations were heavy in the Park Rapids area. INTRODUCED PINE SAWFLY (*Diprion similis*) populations were higher in the Brainerd area. Some spraying was done in the east central district. High populations of WHITE-PINE APHID (*Cinara strobi*) required spraying in the north central and east central districts. BIRCH SAWFLY (*Arge pectoralis*) caused heavy defoliation of birch stands near Nett Lake in the north central district. Pre-pupa populations of VARIABLE OAK LEAF CATERPILLAR (*Heterocampa manteo*) were abundant in May and June near Brainerd but defoliation was much reduced in both severity and area from 1955. EUROPEAN FRUIT LECANIUM (*Lecanium corni*) was very abundant statewide. The heavy infestations in Duluth and the iron range towns in 1955 never materialized in 1956. Natural control by predators and parasites reduced the infestation to almost nothing.

Insects Affecting Man and Animals: MOSQUITO emergence in the latter part of May and through most of June occurred in moderate numbers (Twin Cities). By June 27 a large scale emergence was underway. The mosquito nuisance level continued high and by July 6, heavy mosquito populations had occurred throughout the State. The mosquito nuisance declined during the latter part of July and the first half of August (Twin Cities). However, large populations were reported for July 27 at St. Croix State Park. Heavy rains occurred early in August and by August 17 tremendous numbers of mosquitoes had emerged (Twin Cities area) and control with residual insecticides was very difficult. CHIGGERS were reported commonly from wooded or sandy areas (southeast Minnesota and Lake Minnetonka) by June 29. Numerous reports of CLOVER MITES were received by May 18 for Twin City area and Lyon County. Control efforts by householders were not very successful in many instances. TABANIDS were abundant in woods of northern area and were a serious pest problem to livestock farmers in the northern half of State. Some of the newer fly repellents were used in limited quantities. "Normal" populations of house fly and stable fly occurred. BLACKFLIES were extremely abundant in northern area (Ely) by May 28 and high populations persisted through much of the summer. They were reported very abundant on August 3 at St. Croix State Park. WOOD TICKS were reported abundant by May 18. Judging from the number of reports and inquiries received it would appear that tick populations during the past season were somewhat higher than usual. Many inquiries concerning control were received from the Twin City suburban area.

SUMMARY OF INSECT CONDITIONS - 1956

NEVADA

Reported by H. E. Gallaway

Highlights: Nevada can class 1956 as an "aphid-leafhopper" year. These two types of insects infested a much greater area and developed more economic populations than in previous years. Most of the other insects continued in normal numbers. Alfalfa weevil, spotted alfalfa aphid, cutworms, armyworms, pea aphid, mites (clover and two spotted), grasshoppers and crickets, and various truck and fruit insects developed economic populations requiring control.

Cereal and Forage Insects: ALFALFA WEEVIL (*Hypera postica*) was the number one insect enemy of forage crops. Damage to untreated fields was moderate to severe over most of the northern half of the State. Late treatment for control of adults necessitated additional larval control in many instances. Losses are estimated to exceed 18,000 tons. SPOTTED ALFALFA APHID developed and spread very rapidly during late summer. In the southern counties severe populations were present during February. However, during early spring populations were reduced by chemical and predators. Damage in these areas was not as extensive as in 1955. During the last week in July, Fish Lake Valley in Esmeralda County (adjacent to the California border) was found to be infested. During August, migrations to the north progressed very rapidly. By September 1, Mineral, Churchill, Lyon, Washoe and Pershing Counties were infested with populations developing to economic levels in each. On the eastern side of the State, the infested area progressed north to include all of White Pine County, the eastern half of Eureka County and the Harrison Pass-Jiggs area of Elko County. Losses during 1956 are estimated to exceed $225,000. The loss due to reduction of stand and kill-out cannot be estimated until the spring of 1957 in the principal alfalfa producing counties of Churchill, Lyon, Pershing and Washoe. PEA APHID (*Macrosiphum pisi*) caused substantial losses of alfalfa in Churchill, Douglas, Lyon, Pershing and Washoe Counties. Economic populations developed during the first two weeks in April and remained high until early June. Unusually high numbers were present in most areas throughout the season. ALFALFA CATERPILLAR (*Colias philodice eurytheme*) caused limited local losses to individual fields throughout the State. This insect has been on the increase for the past three years. The first adult appeared in Lyon County, April 18. LYGUS BUGS (*Lygus* sp.) were very abundant in all agricultural areas. In the northern area populations were unusually high on the range. WESTERN YELLOW-STRIPED ARMYWORM (*Prodenia praefica*) damaged alfalfa fields and home gardens locally in Washoe, Lyon and Pershing Counties.

ALFALFA WEBWORM (*Loxostege commixtalis*) damaged fields locally in Lyon County during mid-July. Populations of A LEAFHOPPER (*Aceratagallia fuscoscripta*) were very numerous throughout the alfalfa fields of the State. Degree of damage caused by this insect is unknown. First record of SWEETCLOVER WEEVIL (*Sitona cylindricollis*) in the State was in Washoe County. CLOVER MITE (*Bryobia praetiosa*) developed economic populations on alfalfa in Lyon County. This pest has become one of the major nuisance pests of households in western Nevada with its habit migrating to homes in the fall. WESTERN HARVESTER ANT (*Pogonomyrmex occidentalis*) remains one of the major pests of rangelands with thousands of acres denuded. CORN EARWORM (*Heliothis zea*) caused moderate to extensive damage to field corn. Many growers are discontinuing the growing of this crop due to this insect in southern Nevada. ENGLISH GRAIN APHID (*Macrosiphum granarium*) populations were at their lowest point of the past five years; no economic populations reported.

GRASSHOPPER populations throughout the principal cultivated areas were mostly non-economic. The exception to this was severe infestations of the CLEAR-WINGED GRASSHOPPER (*Camnula pellucida*) in the northeastern area; Eureka and Elko Counties, and in northern Washoe and Humboldt Counties. These infestations were primarily confined to native pasture and hay lands with migrations to and from adjacent rangeland. Control treatment was made to 16,340 acres. Approximately 400 acres of cultivated lands required control in Churchill County for a mixed population of *Melanoplus mexicanus*, *M. packardii* and *Schistocerca lineata*. The adult grasshopper survey indicates approximately 28,000 acres of *C. pellucida* will require control in 1957. MORMON CRICKET (*Anabrus simplex*) required treatment on 8,624 acres in Diamond Mountain area of Eureka County. Damage was held to a minimum. The adult survey indicates a serious build-up in most areas that will require 28,000 acres to receive control in 1957 to stop a large scale general outbreak reaching across the northern half of the State. During November, A WHITE GRUB (*Aphodius* sp.) severely damaged native pasture in Ruby Valley, Elko County. The defoliation of big sagebrush by the SAGEBRUSH DEFOLIATOR (*Aroga websteri*) decreased in 1956. A new species of CRICKET (*Idiostatus* sp.) between *I. elegans* and *I magnificus*, infested infested 400 rangeland acres in western Humboldt County; population averaging 3 per square yard was controlled.

Fruit Insects: LESSER PEACH TWIG BORER (*Synanthedon pictipes*) caused considerable damage to peach and plum trees weakened by the previous winter weather. PEACH TWIG BORER (*Anarsia lineatella*) severely damaged unsprayed trees. GREEN PEACH APHID (*Myzus persicae*) severely damaged peach and plum trees over the western part of the State. CODLING MOTH(*Carpocapsa pomonella*) infestations ranged up to 100 percent in most unsprayed trees. Very little control treatment was used. FRUIT TREE LEAF ROLLER (*Archips argyrospila*) was quite general over western Nevada. PEAR-SLUG

(*Caliroa cerasi*) severely damaged cherry and pear trees. WOOLLY APHIDS (*Eriosoma* sp.) were more severe this year than for past several years.

Truck Crop Insects: WHITE-LINED SPHINX (*Celerio lineata*) and related species caused light damage to potatoes in Lyon County. LYGUS BUGS (*Lygus* sp.) generally numerous in all cultivated crops. ONION THRIPS (*Thrips tabaci*) was present in usual numbers in all onion fields, requiring two and, in some instances, three treatments to control. BEET LEAFHOPPER (*Circulifer tenellus*) migration into the Moapa Valley, Clark County, was very light resulting in a small amount of curly top present in tomato plants. Populations on sugar beet seedlings being grown for seed production averaged 0.40 and 0.60 per foot of row in the Moapa and Virgin Valleys respectively during October with curly top incidence from 5 to 10 diseased beets per 100 feet of row on November 12. ZEBRA CATERPILLAR (*Ceramica picta*) caused light damage to sugar beets in Churchill County.

Cotton Insects: TWO SPOTTED SPIDER MITE (*Tetranychus telarius*) required control on 126 acres in Nye County. BOLLWORM (*Heliothis zea*) populations were non-economic. Survey on PINK BOLLWORM (*Pectinophora gossypiella*) and BOLL WEEVIL (*Anthonomus grandis* was negative.

Forest, Ornamental and Shade Tree Insects: ELM LEAF BEETLE (*Galerucella xanthomelaena*) populations increased along perimeter of infested area. Control programs decreased over-all damage from previous years. EUROPEAN ELM SCALE (*Gossyparia spuria*) was severe on most trees receiving no control treatment. A SAWFLY (*Neodiprion* sp.) damaged pine in Ormsby County. A SAWFLY (*Zaraea americana*) severely defoliated cultivated snowberry in Washoe County. LEAFHOPPERS (various species) were present in large numbers attacking all types of vegetation. A LEAFHOPPER (*Dikraneura absenta*) severely damaged lawns and flowering annuals. VIRGINIACREEPER LEAFHOPPER (*Erythoneura ziczac*) again defoliated most of the Virginia creepers in western Nevada.

Stored Products Insects: A DERMESTID (*Trogoderma parabile*) was encountered three times in Clark County; once each in wholesale grocery, private home, and agricultural seed. First record for Nevada.

Man, Animals and Household Insects: FLY problems were more numerous especially in southern and western parts of State. MOSQUITO populations were much higher in northern part of State due to increased moisture in 1956. BITING MIDGE populations increased and became troublesome during August and September in southern Nevada. CATTLE LICE, CATTLE GRUBS, HORN FLY, STABLE FLY, HOG LICE, SHEEP TICK caused normal damage generally over the State. TERMITE infestations in houses are increasing especially in western and southern Nevada. CLOVER MITE (*Bryobia praetiosa*) is becoming a serious pest of households in western part of State.

Beneficial Insects: Increase in populations of predators of the spotted alfalfa aphid (lady beetles, damsel bugs, big-eyed bugs and lacewings) was very evident in areas infested with the aphid in 1955. Lady beetle populations increased in most areas throughout the State especially in the southern part where a number of releases were made.

INSECTS NOT KNOWN TO OCCUR IN UNITED STATES

A Chafer (*Melolontha melolontha* (L.))

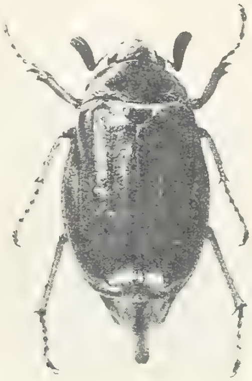
Economic Importance: This scarabaeid is a major pest in Europe. Serious damage from both larvae and adults has been recorded in Czechoslovakia and severe losses have been observed on beets and cereals in Denmark. An outbreak in British Isles in 1932 was serious on strawberry, young fruit trees, vegetables and cereals. In some cases losses were estimated at over 100 pounds sterling per acre. Larvae caused up to 65 percent loss of peas and beans on several farms in that country in 1937. In Rumania this beetle has caused considerable injury in vineyards.

Distribution: British Isles, Austria, Denmark, France, Germany, Holland, Hungary, Italy, Latvia, Russia, Poland, Sweden, Rumania, Switzerland.

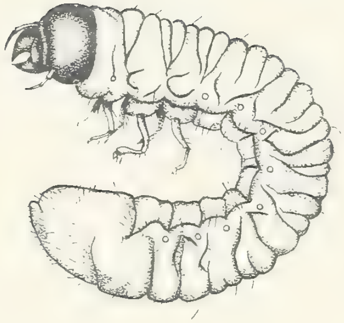
Hosts: This chafer has been recorded on over 60 hosts including fruits: strawberry, grape, apple, pear, plumcherry ; vegetables: peas, beans, onion, lettuce, potato, crucifers; field crops: oats, barley, maize, soybean, tobacco, alfalfa, clover; and many ornamentals and trees. Larvae attack roots of almost any plant and adults damage leaves of fruit, ornamentals, forest and shade trees.

Description: The adult is about an inch long with black head and thorax and reddish-brown elytra. Club-shaped end segments of antennae have seven leaves in male and six in female. The club of the antenna is much longer in the male. The milky white, fleshy, curved and wrinkled larva is one and one-half inches long when full grown. The species may be identified by number and arrangement of spines on the ventral surface of the last body segment (see illustration). These spines form two rows, 25 to 30 in each row, near the middle of the segment. The pupa has the general appearance of an adult but is orange-yellow in color. It is about one and one-eight inches in length.

Life History: Under conditions in the British Isles the life history of this species is as follows: Adults usually appear during first warm weather in May and are on wing until early in July. They fly mostly in the evenings and are not conspicuous at any time during the period. Adults feed on leaves of a variety of trees and shrubs, especially oak, beech, elm, birch, apple and hawthorn but caused no important damage. Mating occurs on trees and the female burrows into the soil to oviposit at depths of 3-15 inches. About 24 eggs are laid together and this group may be followed by a second batch after the female feeds above ground for about two additional weeks. The eggs hatch in about six or seven weeks and the small larvae begin feeding on fine roots of grasses, young trees and other plants. In late September they move down to levels of 12 to 30 inches and remain inactive until spring when they ascend to upper levels of the soil and resume feeding. Pupation occurs in the third year but adults do not emerge until the following spring thus four years are required for a life cycle. Numbers of adults vary from year to year but there is usually a "flight year" once in four when the chafers are much more abundant. (Prepared in Plant Pest Survey Section in cooperation with other ARS agencies). January 11, 1957



Adult. Slightly over natural size. 1/



Larva. About two times natural size. 2/

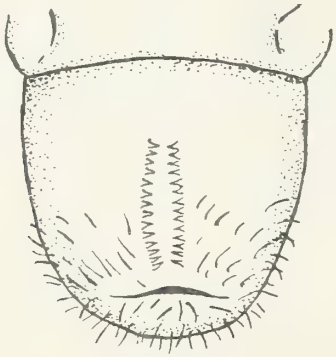


Diagram of ventral surface of hind segment. 2/

1/ Reproduced from H. M. Forest. Comm. Leaf. 17.

2/ Reproduced from "Insects of the British Woodlands," R. Neil Chrystal.

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TO COOPERATORS:

This map is based upon the results of cooperative grasshopper
The surveys reveal where, how many, and what kinds of grasshop
infestations for 1957. Nymphal surveys, made each spring imme
grasshopper populations which will warrant control that growin

Surveys are planned and performed with participating States, by
survey information is used by farmers, ranchers, County and St
cides and equipment, and those directly charged with grasshopp
and effective control programs. The map, "Grasshopper Outlook
states.

The infestation on croplands shown on the map in stippling is
will be handled by the farmers with technical assistance from
in solid colors total 22,190,280 acres in 19 western and midwe

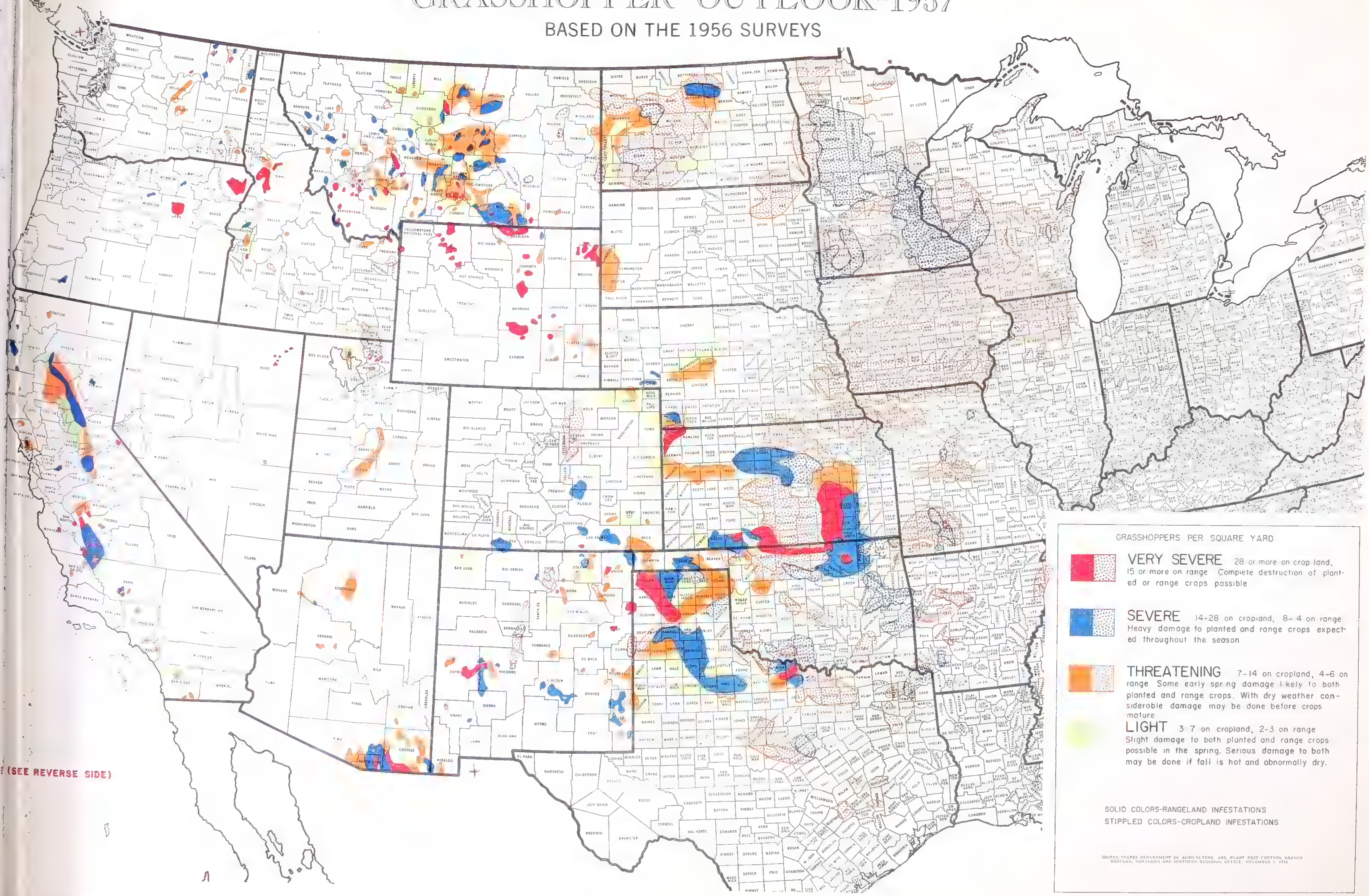
POTENTIAL RANGELAND GRASSHOPP

Region and State	Landownership - Acres		
	Private & State	Public Domain	(
CENTRAL:			
Kansas	2,045,000	-	2,
Missouri	-	1,800	
Nebraska	1,052,000	-	1,
North Dakota	126,000	452,000	
South Dakota	80,000	150,000	
WESTERN:			
Arizona	1,921,000	779,000	2,
California	1,137,000	-	1,
Colorado	1,109,000	86,000	1,
Idaho	140,000	95,000	

Detailed information concerning the Grasshopper problem in spe
County agents, and plant pest control branch personnel.

GRASSHOPPER OUTLOOK-1957

BASED ON THE 1956 SURVEYS



GRASSHOPPERS PER SQUARE YARD

🟥 **VERY SEVERE** 28 or more on crop land, 15 or more on range Complete destruction of planted or range crops possible

🟦 **SEVERE** 14-28 on cropland, 8- 4 on range Heavy damage to planted and range crops expected throughout the season

🟧 **THREATENING** 7-14 on cropland, 4-6 on range Some early spring damage likely to both planted and range crops. With dry weather considerable damage may be done before crops mature

🟩 **LIGHT** 3 7 on cropland, 2-3 on range Slight damage to both planted and range crops possible in the spring. Serious damage to both may be done if fall is hot and abnormally dry.

SOLID COLORS-RANGELAND INFESTATIONS
STIPPLED COLORS-CROPLAND INFESTATIONS

UNITED STATES DEPARTMENT OF AGRICULTURE, ARS, PLANT PEST CONTROL BRANCH
WESTERN, NORTHERN AND SOUTHERN REGIONAL OFFICE, NOVEMBER 1 1956

(SEE REVERSE SIDE)

GPO 843068

PARTMENT OF AGRICULTURE
ESEARCH SERVICE
ONTROL BRANCH

DULT AND EGG SURVEYS MADE DURING THE LATE SUMMER AND FALL OF 1956.
PERS INFEST AN AREA AND INDICATE THE POTENTIAL SEVERITY OF GRASSHOPPER
DIATELY BEFORE THE ONSET OF CONTROL WORK, PROVIDE THE FINAL INDEX OF
SEASON.

THE PLANT PEST CONTROL BRANCH, AGRICULTURAL RESEARCH SERVICE. THE
ATE AGENCIES, FEDERAL LAND MANAGEMENT PERSONNEL, DEALERS IN INSECTI-
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- 1957", REFLECTS THE POTENTIAL GRASSHOPPER PROBLEM IN THE INFESTED

ENERALLY AS THREATENING AS IT WAS IN 1956. CONTROL ON THOSE LANDS
BRANCH AND STATE PERSONNEL. THE INFESTED RANGE AREAS SHOWN ON THE MAP
STERN STATES.

R CONTROL PROBLEM - ACREAGE BY REGIONS - 1957

TOTAL (ACRES)	REGION AND STATE	LANDOWNERSHIP - ACRES		TOTAL (ACRES)
		PRIVATE & STATE	PUBLIC DOMAIN	
	MONTANA	2,041,000	966,000	3,007,000
045,000	NEVADA	18,500	9,500	28,000
1,800	NEW MEXICO	2,087,530	416,890	2,504,420
052,000	OREGON	189,000	114,000	303,000
578,000	UTAH	82,370	47,630	130,000
230,000	WASHINGTON	14,500	4,500	19,000
	WYOMING	725,920	101,140	827,060
720,000	SOUTHERN:			
137,000	ARKANSAS	230,000	-	230,000
195,000	OKLAHOMA	1,020,000	100,000	1,120,000
235,000	TEXAS	4,787,000	41,000	4,828,000

IFIC AREAS OR STATES CAN BE OBTAINED FROM STATE PEST CONTROL OFFICIAL

WESTERN PLANT PEST CONTROL REGIONAL OFFICE, A.R.S., U.S.D.A.
P. O. BOX 1647, OAKLAND, CALIFORNIA

NOVEMBER 1, 1956

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Plant Pest Control Branch

TO COOPERATORS:

This map is based upon the results of cooperative grasshopper adult and egg surveys made during the late summer and fall of 1956. The surveys reveal where, how many, and what kinds of grasshoppers infest an area and indicate the potential severity of grasshopper infestations for 1957. Nymphal surveys, made each spring immediately before the onset of control work, provide the final index of grasshopper populations which will warrant control that growing season.

Surveys are planned and performed with participating States, by the Plant Pest Control Branch, Agricultural Research Service. The survey information is used by farmers, ranchers, County and State Agencies, Federal land management personnel, dealers in insecticides and equipment, and those directly charged with grasshopper control as a basis for planning and executing timely, economical, and effective control programs. The map, "Grasshopper Outlook - 1957", reflects the potential grasshopper problem in the infested states.

The infestation on croplands shown on the map in stippling is generally as threatening as it was in 1956. Control on those lands will be handled by the farmers with technical assistance from Branch and State personnel. The infested range areas shown on the map in solid colors total 22,190,280 acres in 19 western and midwestern states.

POTENTIAL RANGELAND GRASSHOPPER CONTROL PROBLEM - ACREAGE BY REGIONS - 1957

Region and State	Landownership - Acres		Total (Acres)	Region and State	Landownership - Acres		Total (Acres)
	Private & State	Public Domain			Private & State	Public Domain	
CENTRAL:				Montana	2,041,000	966,000	3,007,000
Kansas	2,045,000	-	2,045,000	Nevada	18,500	9,500	28,000
Missouri	-	1,800	1,800	New Mexico	2,087,530	416,890	2,504,420
Nebraska	1,052,000	-	1,052,000	Oregon	189,000	114,000	303,000
North Dakota	126,000	452,000	578,000	Utah	82,370	47,630	130,000
South Dakota	80,000	150,000	230,000	Washington	14,500	4,500	19,000
WESTERN:				Wyoming	725,920	101,140	827,060
Arizona	1,921,000	779,000	2,720,000	SOUTHERN:			
California	1,137,000	-	1,137,000	Arkansas	230,000	-	230,000
Colorado	1,109,000	86,000	1,195,000	Oklahoma	1,020,000	100,000	1,120,000
Idaho	140,000	95,000	235,000	Texas	4,787,000	41,000	4,828,000

Detailed information concerning the Grasshopper problem in specific areas or states can be obtained from State pest control officials county agents, and plant pest control branch personnel.

Western Plant Pest Control Regional Office, A.R.S., U.S.D.A.
P. O. Box 1647, Oakland, California

November 1, 1956